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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,059	07/03/2001	Tomasz L. Klosowiak	210295US99	8413

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EXAMINER

WILLE, DOUGLAS A

ART UNIT PAPER NUMBER

2814

DATE MAILED: 05/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/897,059

Applicant(s)

KLOSOWIAK ET AL

Examiner

Douglas A Wille

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 17 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 17-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claims 1 - 16 in Paper No. 8 is acknowledged. The traversal is on the ground(s) that it does not meet requirements. This is not found persuasive because the restriction meets requirements.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1 - 16 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Structural information critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527

F.2d 1229, 188 USPQ 356 (CCPA 1976). Claim 1 describes a piezoelectric material where one portion expands differently from another portion when a voltage is applied. First, it is assumed that the electrodes referred to in the specification cover the entire top and bottom surfaces of the prism shaped structure and that therefore the prism is on applied as a separate piece to the layer 126. Second, if a voltage is applied between the top and bottom electrodes the electric field will vary, becoming smaller where the structure is thicker. Thus it is not clear if there will be a differential expansion of the structure or if the device will function as described and claimed. Claim 12 refers to an array of electrodes but it is not shown how such an array would be configured and details such as whether it is a contiguous one dimension array of electrodes or

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line element electrodes or a two dimensional array. Claim 12 as applied to claim 1 shows an optical surface with an array of electrodes where the voltage applied to the electrodes will cause a differential expansion. It is not shown how such an array could be made to cause an expansion that would still maintain an optical surface.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention

5. Claims 1 – 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 describes a piezoelectric material where one portion expands differently from another portion when a voltage is applied. If a voltage is applied between the top and bottom electrodes the electric field will vary, becoming smaller where the structure is thicker. Thus it is not understood if there will be a differential expansion of the structure or if the device will function as described and claimed.

7. Claim 12 refers to an array of electrodes but it is not understood how such an array would be configured and details such as whether it is a contiguous one dimension array of electrodes or line element electrodes or a two dimensional array are not understood. Claim 12 as applied to claim 1 shows an optical surface with an array of electrodes where the voltage applied to the electrodes will cause a differential expansion. It is not understood how such an array could be made to cause an expansion that would still maintain an optical surface due to the granularity of voltage distribution.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1 - 3, 6, 9 - 12 and 14 - 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calviello et al. in view of Ramesh, Joshi, Chen et al. and Baker.

10. With respect to claim 1, Calviello et al. show (see Figure 1 and column 2, line 35 et seq.) the growth of GaAs (column 2, line 64) on a buffer layer of SrTiO₃ (column 2, line 58). Ramesh shows (see cover Figure and column 3, line 10) the growth of a layered perovskite on SiO₂ on a Si substrate. Joshi shows (see cover Figure and column 3, line 25 et seq.) the formation of a GaAs device on a silicon substrate where different functions are performed in each material. Chen et al. show (see cover Figure and column 2, line 30 et seq.) the formation of a piezoelectric device and a semiconductor device using the same material which is preferentially selected as GaAs (column 2, line 35). Baker shows (see cover Figure and column 5, line 3 et seq.) a piezoelectric material structure that expands a different distance when a voltage is applied to displace an optical surface. It would have been obvious to use the technique shown by Ramesh to grow the GaAs layer of Calviello on Si to provide a multimaterial structure as shown by Joshi to avoid the lattice mismatch problem, to use the same material for the piezoelectric and electronic functions to provide an integrated structure and to use the modulator shown by Baker to provide a utility for the structure.

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11. With respect to claims 2, 3 and 6, the surface displacement shown by Baker deflects a light beam (see also Figure 2) and 14a is a planar reflective surface.

12. With respect to claim 9, 11a is wedge shaped.

13. With respect to claims 10 – 12, Baker shows an array of piezoelectric structure, each having a separate voltage (Figures 6, 7 and column 7, line 36).

14. With respect to claims 14, 15 and 16, Chen et al. show GaAs.

15. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calviello et al. in view of Ramesh, Joshi, Chen et al. and Baker and further in view of Chenausky et al.

16. With respect to claim 5, Chenauski et al. show a piezoelectric device with an attached grating reflector (see cover Figure and column 4, line 19 et seq.). It would have been obvious to use the structure shown by the basic references to provide the Chaunski et al. device since it provides an integrated structure which will simplify fabrication.

17. With respect to claim 4, it would be obvious to use a holographic grating since the grating shown and a holographic grating are effectively the same structure since they depend of a diffractive effect and are equivalent.

18. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calviello et al. in view of Ramesh, Joshi, Chen et al. and Baker and further in view of Michelet et al.

19. Michelet et al. show that a piezoelectric structure can be used to form a curved optical surface (see cover Figure and column 2, line 59) which inherently has a focal point. It would have been obvious to use the structure shown by the basic references to provide the Michelet et al. device since it provides an integrated structure which will simplify fabrication.

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20. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Calviello et al. in view of Ramesh, Joshi, Chen et al. and Baker and further in view of Thaxter.

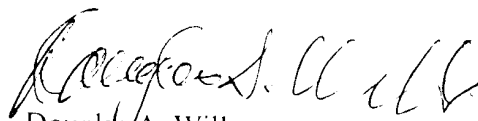
21. Thaxter shows a piezoelectric deflector (see cover Figure and column 3, line 32 et seq.) with piezoelectric strips 10, 11 that expand independently to deflect the mirror 13. It would have been obvious to use basic structure for the Thaxter device to provide the substrate and electronic drive to supply details not provided by Thaxter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (703) 308-4949. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Douglas A. Wille
Primary Examiner

May 20, 2003